

CLAIMES

1. The image processing method, comprising the presentation of the original
5 image as a matrix of the discrete picture elements (pixels), splitting of the original
image into n frequency channels, each channel presented by an image matrix of
the same size as the original image, the detection of edges, and assembling of the
output image from said n frequency channels taking the detected edges into
account, CHARACTERIZED BY splitting of the original image into the low
10 frequency channel and $n-1$ high frequency channels and detection of edges by
computation in each of $n-1$ selected high frequency channels for each pixel of the
correlation between processing pixel and its neighboring pixels followed by
comparison of said correlation value with correlation values for the corresponding
(by their location in the image) pixels in other high frequency channels and with
15 the threshold value for this channel; basing on the results of said comparison, the
weighting coefficients are formed for each pixel of each of $n-1$ high frequency
channels, and the assembly of the output image is made by summing each pixel
from the low frequency channel with all the corresponding (by their location in the
image) pixels of $n-1$ high frequency channels multiplied by their weighting
20 coefficients.

2. The method according to claim 1, CHARACTERIZED BY determination of
said weighting coefficient for each pixel of each of $n-1$ high frequency channels
by comparison of the corresponding correlation value to the threshold value.

3. The method according to claim 2, CHARACTERIZED BY the specific dependence of the weighting coefficient on the correlation and threshold values:

- the weighting coefficient takes a minimal value for correlation values that are significantly smaller than the threshold value;
- 5 - the weighting coefficient smoothly increases from its minimal value to its maximal value for correlation values that are close to the threshold value;
- the weighting coefficient takes its maximal value for correlation values that are significantly larger than the threshold value.

4. The method according to claim 2, CHARACTERIZED BY the specific dependence of the weighting coefficient on the correlation and threshold values:

- the weighting coefficient takes a minimal value for correlation values that are significantly smaller than the threshold value;
- the weighting coefficient smoothly increases from its minimal value to its maximal value while the correlation value increases to the second threshold value, said second threshold value is equal to the product of the first threshold value by a pre-defined coefficient;
- 15 - the weighting coefficient smoothly decreases from its maximal value to its limit value while correlation value is larger than the second threshold value.

5. The method according to claim 1, CHARACTERIZED BY m of said $n-1$ high frequency channels, where $2 \leq m \leq n-1$, being different one from another in the direction of their principal passing only.

6. The method according to claim 5, CHARACTERIZED BY determination of said weighting coefficient for each pixel of each of m high frequency channels by comparison of the corresponding correlation value to the threshold value and to

the correlation values for corresponding (by their location in the image) pixels of other $m-1$ high frequency channels.

7. The method according to claim 1, CHARACTERIZED BY the picture element (pixel) being represented by a scalar value characterizing, for example, the image intensity at the corresponding pixel.

8. The method according to claim 7, CHARACTERIZED BY computation of said correlation value for each pixel by multiplication of said pixel value by the weighted sum of its neighboring pixels.

9. The method according to claims 8 and 5, CHARACTERIZED BY use of anisotropic weights for computation of said weighted sum of the neighboring pixels, thereat the direction of said anisotropy corresponds to the direction of principal passing for the processing frequency channel.

10. The method according to claim 7, CHARACTERIZED BY determination of said threshold value for each of said $n-1$ high frequency channels by analysis of distribution of pixel values in an image of the processing frequency channel.

11. The method according to claim 7, CHARACTERIZED BY determination of said threshold value for all said frequency channels by analysis of distribution of pixel values of the original image.

12. The method according to claim 1, CHARACTERIZED BY the picture element (pixel) being represented by a vector, components of said vector characterizing, for example, the intensity of the basic colors (red, green and blue) at the corresponding pixel.

13. The method according to claim 12, CHARACTERIZED BY computation of said correlation value for each pixel as a scalar product of said pixel vector by the weighted sum of vectors representing its neighboring pixels.

14. The method according to claims 13 and 5, CHARACTERIZED BY use of anisotropic weights for computation of said weighted sum of the neighboring pixels, thereat the direction of said anisotropy corresponds to the direction of principal passing for the processing frequency channel.

15. The method according to claim 12, CHARACTERIZED BY determination of said threshold value for each of said n-1 high frequency channels by analysis of distribution of absolute values of vectors representing pixels of an image of the processing frequency channel.

16. The method according to claim 12, CHARACTERIZED BY determination of said threshold values for all high frequency channels by analysis of distribution of absolute values of vectors representing pixel values of the original image.

17. The method according to claim 1, CHARACTERIZED BY smoothing of the correlation values for several neighboring pixels before computation of the weighting coefficients, said smoothing being implemented at least in one of n-1 high frequency channels.

18. The method according to claim 17, CHARACTERIZED BY non linear transformation of the correlation values prior to the smoothing of the correlation values, said non linear transformation remains unchanged the values that are smaller or close to the threshold value, and decreases correlation values that are significantly larger than the threshold value.

19. The method according to claim 1, CHARACTERIZED BY smoothing of the weighting coefficients over several neighboring pixels, said smoothing being implemented at least in one of $n-1$ high frequency channels.

20. The method according to claim 1 CHARACTERIZED BY the input image
5 being p dimensional matrix of picture elements, where p is greater or equal to 3.

21. The method according to claim 1, CHARACTERIZED BY use of different threshold values for different parts of the image, said different threshold values being used to form the weighting coefficients at least in one of $n-1$ high frequency channels.

10 22. The method according to claims 7 and 21, CHARACTERIZED BY determination of said threshold values for different parts of the image and different high frequency channels by the analysis of distribution of pixel values in the corresponding part of the image of the corresponding frequency channel.

15 23. The method according to claims 12 and 21, CHARACTERIZED BY determination of said threshold values for different parts of the image and different frequency channels by the analysis of distribution of absolute values of vectors representing pixels in the corresponding part of the image of the corresponding frequency channel.